

## Trace Contaminant Monitor for Air in Spacecraft, Phase I

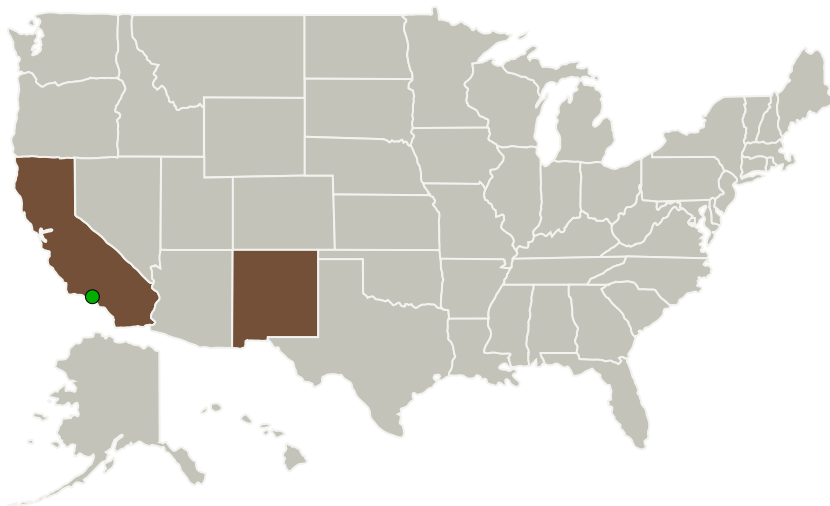
Completed Technology Project (2010 - 2010)



## Project Introduction

A need exists for analyzers that can measure trace contaminants in air on board spacecraft. Toxic gas buildup can endanger the crew particularly during long missions. Some gases are generated by people and emitted through the skin or by exhalation. In addition to carbon dioxide, these anthropogenic gases include carbon monoxide, ammonia, hydrogen sulfide, acetaldehyde, and methanol. Plastics used in the spacecraft cabin can outgas formaldehyde, and heat exchangers can leak ammonia into breathing air. Overheating electronics can release carbon monoxide, hydrogen cyanide, hydrogen chloride and hydrogen fluoride. Thus, continuous air monitoring is required. Mesa Photonics proposes development of a highly miniaturized, highly efficient Fourier Transform (FT) spectrometer for continuous monitoring of contaminant air. The spectrometer will be able to detect a wide range of compounds with response times of about 30 seconds. Our approach combines several innovations that will lead to a rugged and reliable spectrometer capable of space-based operation and having a long shelf life. Spectrometers will be about the size of a lap-top computer, weigh about 4 kg, and consume about 10 W. Most target contaminants will be detectable at part-per-million or lower concentrations.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Mesa Photonics, LLC	Lead Organization	Industry	Santa Fe, New Mexico
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	New Mexico

## Project Transitions

**January 2010:** Project Start**July 2010:** Closed out**Closeout Summary:** Trace Contaminant Monitor for Air in Spacecraft, Phase I Project Image**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/138699>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Mesa Photonics, LLC

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

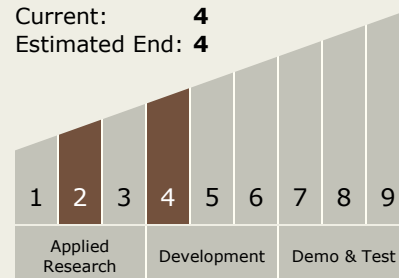
David Bomse

## Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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## Technology Areas

### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - └ TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System